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(30) Process for increasing the bleaching efficiency of an inorganic persalt.

(31) A bleach activating agent consisting of an acetylated mixture of sorbitol and mannitol is added to an inorganic persalt in order to increase the bleaching efficiency of the said persalt. The weight ratio of sorbitol to mannitol may range from 2.5 : 1 to 4.0 : 1, while the degree of acetylation of the mixture may vary between 1 and 6. Hydrogenated corn syrup or hydrogenated invert sugar may be used as the source of the activating agent, which is used in bleaching and/or detergent compositions suitable for removing stains from textiles, paper, cellulose, cork and hair.

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C = whiteness degree of the swatch completely bleached.

The whiteness degree of the swatches is expressed as percentage of the whiteness degree of MgO, as standard, when measured with a filter No. 6 (wavelength = 484 nm). The thus obtained percentage (68,0%) is reported in Table 1.

Example 2

Example 1 was repeated with the difference that the amount of the bleaching activator SORMAN-1 was 18 g/washing cycle (corresponding to 12% in the detergent) and the amount of sodium sulfate was accordingly reduced in the detergent composition. The obtained results are reported in Table 1.

Examples 3 and 4 (comparative examples)

The bleaching efficiency of TAED was determined according to example 1 by using 8 g/washing cycle (4%) and, respectively, 18 g TAED/washing cycle (12%). The obtained results are reported in Table 1.

Examples 5 to 6 (comparative examples)

Examples 1 and 2 were repeated with the difference that SORMAN-1 was replaced by an equal amount of hexa acetyl sorbitol (examples 5 and 6) and, respectively, hexa acetyl mannitol (examples 7 and 8). The results reported in Table 1 clearly show the synergistic effect obtained by the use of SORMAN-1, namely the bleaching activity exhibited by the individually use of acetylated sorbitol and of acetylated mannitol is lower than that obtained by SORMAN-1.

Examples 9-10 (comparative examples)

Examples 1 and 2 were repeated with the difference that SORMAN-1 was replaced by an equal amount of the physical mixture of hexa acetyl sorbitol and hexa acetyl mannitol wherein the weight ratio of the acetylated sugars was 3:1. The obtained results, reported in Table 1, show that the bleaching efficiency of the physical mixture is lower than that achieved by SORMAN-1 (examples 1 and 2).

Example 11

Four automatic washing machines of the Siemens Siwamat Plus 37001 Company were cyclic changed to avoid systematic error and were made to run under the following conditions:

- washing programme at 60° C,
- linen load: 4,5 kg dirty household cloths + test tissues per washing cycle.
- 4% SORMAN-1 per washing cycle, as recorded in Table 2, were added to the following detergent composition:
- 145,1 g zeolite/polycarboxylate detergent,
- 37,6 g perborate tetra hydrate.

For the determination of the bleaching efficiency (bleaching booster activity) the dirty household linen was washed together with 6 standar dirty tissues (in cotton or polyester/cotton) stained with either cacao, tea, coffee, red wine or blood.

At the end of the washing cycle the tissues discharged from the washing machines, were dried and ironed. The obtained bleaching degree was determined according to DIN 44983 T21 by measuring the remission of the washed stained standard tissues.

The results are reported in Table 2.

After 25 washing cycles the loss in tensile strength (%) and, respectively, the inorganic incrustation (%) were determined according to DIN 53 919 T02, DIN 53 857 T01 and, respectively, DIN 44 983 T21. The results are reported in Table 3.

Table 1

Activator amount (g/washing)	6 (4%)	18 (12%)
Activators	Bleaching %	
SORMAN-1 (examples 1, 2)	68,0	73,4
TAED (examples 3 and 4)	69,4	76,9
hexa acetyl sorbitol (examples 5 and 6)	63,7	68,0
hexa acetyl mannitol (examples 7 and 8)	66,9	72,0
physical mixture (examples 9-10)	66,0	68,0

Table 2

SORMAN-1 amount (%)	0	4
Standard dirty tissues	Remission	
Cotton/Cacao (wfk 10F)	63,2	67,4
Cotton/Coffee (wfk 10K)	79,4	61,5
Cotton/Tea (CFT BC-1)	58,6	62,2
Polyester/Cotton/Tea (CFT PC/BC-1)	49,6	54,2
Bleaching intensity	67	74

The abbreviations in Table 2, such as wfk 10F, wfk 10K, CFT BC-1 etc. relate to the kind of the standard dirty tissues used in example 11. These standards are produced by "wfk-Institute für Angewandte Forschung GmbH" (D-4150 Krefeld 1).

Table 3

SORMAN-1 amount (%)	0	4
Loss in strength (%)	6	6
Inorganic incrustation (%)	4,4	1,1

Claims

1. A process for increasing the bleaching efficiency of an inorganic persalt by adding to said persalt an activating agent consisting of an acetylated mixture of sorbitol and mannitol.
2. The process according to Claim 1, wherein the activating agent contains sorbitol and mannitol in a weight ratio ranging between 2,5:1 and 4,0:1, preferably it is 3:1.
3. The process according to Claim 1, wherein the activating agent has an acetylation degree of from 1 to 6, preferably 4 to 6.
4. The process according to Claim 1, wherein the activating agent is an acetylation product obtained from hydrogenated corn syrup having fructose content ranging from 42 to 55% or from hydrogenated invert sugar.
5. The process according to Claim 1, wherein the molar ratio between the activating agent and the

inorganic persalt is from 10:80 to 50:50.

6. Bleaching and/or detergent compositions containing an inorganic persalt and an activating agent consisting of an acetylated mixture of sorbitol and mannitol.

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EUROPEAN SEARCH REPORT

Application Number

EP 91 11 2870

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.)
X	FR-A-2 200 397 (KAO SOAP CO. LTD.) * page 1, line 1 - page 3, line 34 *	1,3,5	C1103/39
X	WORLD PATENTS INDEX LATEST Week 9114, Derwent Publications Ltd., London, GB; AN 91-102063 & WO-A-9 103 542 (KAO CORPORATION) 21 March 1991 * abstract * & EP-A-0447563	1,5,6	
E	EP-A-0 448 337 (THE BELZAK CORPORATION) * page 3, line 44 - page 5, line 24 *	1,4,6	
A	EP-A-0 380 437 (NOVO-NORDISK A/S & THE PROCTER & GAMBLE COMPANY) * page 2, line 40 - page 5, line 21 *	1,5,6	
A	A. STREITWIESER ET. AL, 'INTRODUCTION TO ORGANIC CHEMISTRY' 1976, MACKILLAN PUBLISHING CO. INC., NEW YORK U.S. * page 709, paragraph D - page 709, paragraph E *	4	TECHNICAL FIELDS SEARCHED (Int. Cl.)
			C110
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 MARCH 1992	Examiner DOOLAN G.J.
CATEGORY OF CITED DOCUMENTS			
<p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention I : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>A : member of the same patent family, corresponding document</p>			

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